Populus fremontii / Salix exigua Forest

MAP CLASS	Fremont Cottonwood Woodland
COMMON NAME	Fremont Cottonwood / Coyote Willow Forest
PHYSIOGNOMIC CLASS	Forest (I.)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B.)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2.)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (I.B.2.N.)
FORMATION	Temporarily flooded cold-deciduous forest (I.B.2.N.d.)
ALLIANCE	*Populus fremontii* Temporarily Flooded Forest Alliance

CLASSIFICATION CONFIDENCE LEVEL Weak

USFS WETLAND SYSTEM Palustrine

RANGE

Wupatki National Monument

Fremont Cottonwood / Coyote Willow Forest has been identified in our relevé data from Wupatki NM only on the Little Colorado River. One relevé was found on the north shore banks of the Little Colorado River adjacent to Inscription Point. This small isolated stand of *Populus fremontii* may be a remnant association that is declining due to invasion of non-native *Tamarix* spp. With more extensive sampling on the riverbank of the Little Colorado River larger patches of this association may be identified; however, it is likely that this association is diminishing within the project boundary.

Globally

This riparian forest is known from southwestern New Mexico along the Gila River, the East Fork of the Virgin River in southwestern Utah, and in canyons in north-central Arizona. It likely occurs elsewhere in Utah and Arizona.

ENVIRONMENTAL DESCRIPTION

Wupatki National Monument

Based on one relevé, this association was located on the sandy riverbanks of the Little Colorado River at 4,249 ft (1,295 m).

Globally

This riparian forest association is documented from large rivers in southwestern Utah, southwestern New Mexico, and Arizona. Elevation ranges from 4,003-5,577 ft (1,220-1,700 m). Stands are found on stable bars in floodplains and along streambanks in canyons. Substrates are typically relatively recently deposited alluvium. Stream gradient is typically gentle, and soils are sandy (Muldavin et al. 2000b, Szaro 1989).

MOST ABUNDANT SPECIES

Wupatki National Monument

Stratum	Species
Tree canopy	*Populus fremontii*
Shrub	*Salix exigua*

Globally

Stratum	Species
Tree canopy	*Populus fremontii*
Shrub	*Salix exigua*
Herbaceous	*Phragmites australis*, *Artemisia ludoviciana*

ASSOCIATED SPECIES

Wupatki National Monument

Alhagi maurorum, Tamarix chinensis

Globally
Acer negundo, Betula occidentalis, Ericameria nauseosa, Artemisia tridentata, Quercus gambelii, Distichlis spicata, Muhlenbergia asperifolia, Phragmites australis, Equisetum spp.*, Juncus* spp.*, Carex* spp.

VEGETATION DESCRIPTION
Wupatki National Monument
Fremont Cottonwood / Coyote Willow Forest total vegetation cover was 40%, with 20% absolute cover in the shrub layer and 20% absolute cover the herbaceous layer. Within the one relevé sampled the total species diversity was 7.

Salix exigua is an indicator species in the shrub layer (7% absolute cover). *Tamari*x spp. has higher percent shrub cover (13% absolute cover); however, it is ubiquitous and non-native and is not representative of this native riparian vegetation association. The herbaceous layer had little cover with no dominant species.

Globally
This association is characterized by an open to dense deciduous tree canopy that is dominated by *Populus fremontii*, with *Salix exigua* dominating the tall-shrub layer. *Acer negundo* may be present in the tree canopy, but *Salix gooddingii* is typically not. *Baccharis salicifolia* is also typically not abundant in the shrub layer, but a variety of other riparian and upland shrub species may be present, including *Betula occidentalis*, *Ericameria nauseosa*, *Artemisia tridentata*, or *Quercus gambelii*. The herbaceous layer is generally sparse, depending on the density of the shrub and tree layers. *Distichlis spicata*, *Muhlenbergia asperifolia, Phragmites australis*, and species of *Equisetum*, *Juncus*, and *Carex* are commonly present (Muldavin et al. 2000b, Szaro 1989). Introduced species such as *Elaeagnus angustifolia, Tamarix* spp., *Alhagi maurorum, Melilotus* spp., *Bromus* spp., and *Poa pratensis* are often present in disturbed stands.

CONSERVATION RANK G?

DATABASE CODE CEGL000666

MAP CLASSES
The association Fremont Cottonwood / Coyote Willow Forest is represented by the map class Fremont Cottonwood Woodland (map code 28).

The total area mapped within Wupatki NM is 3 ac (1 ha) within 2 polygons and the total area in the park environs is 12 ac (5 ha) within 12 polygons.

COMMENTS
Wupatki National Monument
The Little Colorado River riverbanks can alter significantly depending on the flooding regime, therefore it is likely that the riverbed has changed from when the photography was taken to when the field sampling was conducted. This map class may be likely to change throughout time and should be reassessed for annual variability in the riverbeds and the vegetation communities.

This association should be assigned special park status to recognize and monitor change in the population throughout time. No *Populus fremontii* juveniles or seedlings were found in the relevé. This may indicate that this association is not recruiting on the banks of the Little Colorado River.

Globally
This association was not reported in the Handbook of Wetland Vegetation Communities of New Mexico (Muldavin et al. 2000b) and needs further review to distinguish from similar associations such as *Populus fremontii - Salix gooddingii / Salix exigua* Forest (CEGL002684). Part of the confusion is related to a taxonomic change in Rio Grande cottonwood from *Populus fremontii* var. *wislizeni* S. Wats. to *Populus deltoides* ssp. *wislizeni* (S. Wats.) Eckenwalder. This change resulted in part of this association (central NM along the Rio Grande) being moved into *Populus deltoides / Salix exigua* Woodland (CEGL002685). More work is needed to determine the range and possible areas of overlap between these two cottonwood species.

Few intact examples of this association remain in the Southwest U.S. It is documented from the Gila, middle Rio Grande and, possibly the lower Pecos rivers of southern New Mexico. It may also occur in southern Arizona. This association is found on stable bars at mid-elevations of the floodplain; it develops on recently deposited alluvium. Flood flows are required for the growth, maintenance and reproduction of this community type. The association continues to be in decline, primarily as a function of major hydrological alterations (dams and diversions), grazing, off-road vehicles and agricultural conversion. The remaining functional stands are restricted to wild rivers such as the Gila and San Francisco rivers, and possibly along the Mimbres River in New Mexico, or the San Pedro River in Arizona. It is a significant association with respect to biodiversity, particularly birds in the Southwest. Stands are rare that have not been invaded by exotic trees, shrubs and herbs. Even protected examples are threatened by continued declines in upland watershed conditions.

Periodic flooding is required for the growth, maintenance and reproduction of this forest.

REFERENCES

Bourgeron and Engelking 1994, Driscoll et al. 1984, Muldavin et al. 1993, Muldavin et al. 2000b, NMNHP n.d., Szaro 1989